

## Modelling and Sensitive Analysis of the Impact on Telematics System in Vehicles

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**Abstract:** The telematics system which is combine in vehicle technology with integrated web-based applications that continuously monitor and rate driving behavior and provide real-time feedback to drivers. Using vehicle Telematics technology, managers can monitor idling, instances of excessive speed, and unauthorized use of their fleet vehicles. Armed with this information, they can address wasteful driver behaviors to significantly reduce the amount of fuel consumed by their fleet and save their company money. This language is known as machine-language, and acts as a bridge between the machine and the programmed. The transmission of electric signals, electric signals, then, materializes information. The aim of paper is the actual case of applications of cameras, monitoring systems, traffic managements center and data collections in field, implemented in one City of Kosovo, and its positive impact in the traffic safety.

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### 1. INTRODUCTION

The term Telematics describes combination of the transmission of information over telecommunication network and computerized processing of this information. Telematics systems are sometimes combined with specialized driver intervention programs (offered by some stakeholders in the fleet industry) that enable truck fleets to monitor, improve, and sustain safe and fuel-efficient driving behaviour. Telematics systems combine in-vehicle technology with integrated Web-based applications that continuously monitor and rate driving behaviour and provide real-time feedback to drivers. A driver intervention process can provide positive motivation to drivers to change their behaviour behind the wheel, and constant reinforcement encourages them to maintain improved behaviour. Although fleet managers and risk and safety professionals gain insight into driving behaviour and have the necessary tools to help drivers achieve specific safety and fuel economy goals, it is estimated that fewer than 20 percent of all motor carriers have adopted any form of Telematics systems. Key reasons for fleets not adopting wireless solutions include reluctance to change business practices, lack of skilled personnel to realize the benefits of Telematics, low awareness of Telematics, high up-front cost, and driver resistance to being monitored.

Existing Telematics systems provide a range of metrics including speeding, excessive RPM, hard braking and sudden acceleration, and fuel consumption. Some Telematics systems have algorithms that incorporate many of these metrics to generate a safety and/or eco-driving score. The

scores may be used by fleet managers as a potential coaching tool to improve driver performance. These systems can be expensive; however, it is estimated that the average payoff period (capital cost of installation) is approximately 10–12 months. Within the automobile industry, revolution has come gradually and certainly over time. One new technology that has the potential to bring substantial change to all features in Automobile Industry is Telematics, with its capacity to monitor vehicle-driving behaviour and communicate back to the user with tremendously rich with real time data. For some carriers, Telematics data provides the basis for understanding how far, how fast and under what conditions a person drives, as well as a substance for more sophisticated data modelling and scorecard development. This ability is fostering new and innovative products that more accurately price risk and attract lucrative new customers, Phial, Robert (2002).

Data is either generated in the vehicle unit and gets relayed to the back office systems or the back office systems push data, like maps, weather forecasts, stock updates, Internet data packets etc. to the vehicle unit. This communication takes place either through the cell phone or the unit fitted in the vehicle itself. The communication and location mapping for the vehicle happens through a network of cellular towers and satellite systems.

The different features offered through this system are:

- a) Safety - features such as automatic crash response, emergency and crisis assistance,
- b) Security – features such as remote door lock/unlock, stolen vehicle tracking,
- c) Navigation – provides maps, turn-by-turn assistance,

- d) Navigation – provides maps, turn-by-turn assistance,
- e) Concierge services – to plan and book itineraries.

The prohibitive cost of infrastructure investment and lack of consumer demand, at the time, prevented it from being accepted by the mainstream. Hence, Telematics Value Chain in Automotive Telematics To identify the opportunities for IT in Telematics, we need to understand and analyse the value chain in this domain, as indicated by the following: Given these forecasts and the close association of Telematics with IT, technology companies with automotive domain competencies will see a substantial opportunity building up, Prof. Vöhringer, K.D (2002).

Telematics is a communication technology for the automobile industry based on information flowing to and generated from vehicles via wireless networks. It is the convergence of wireless communications, location technology and in-vehicle electronics pushing the automobile industry into the information age, Figure 1.

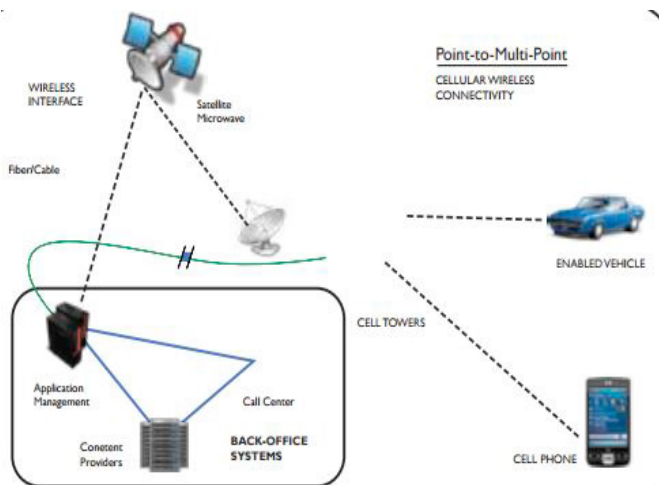


Fig. 1. Technologies of telematics.

Contributions of this work in selected topics of Conference are: *Intelligent Systems and Applications* as well as *Models & Simulation*.

## 2. VEHICLE TELEMATICS

Over 90 percent of all accidents in the European Union are attributable in some way to the driver's behaviour. Intelligent Transport Systems have a positive effect on driver behaviour and improvement of our understanding on their potential which impact on road safety, traffic efficiency and the environment.

To improve drivers' weaknesses and misconduct in a certain degree, industries of vehicles are increasingly investing in intelligent transport systems that are able to identify critical situations early, warning of the dangers if necessary, by intervening actively to take control. Intelligent transport systems in the vehicles reach their potential by reducing the consequences of accidents or their prevention, which is very important for the society both in human and material aspect.

Having in mind the positive side that intelligent systems in vehicles bring at the same time is the negative side from many components that motorists are overloaded with warnings and information in different ways, can be just as counterproductive as non-functional distribution of the tasks between the driver and intelligent systems.

A vehicle Telematics solution combines wireless GPS tracking with remote vehicle diagnostics and routing/ driver productivity tools to give fleet managers a complete, accurate, and timely picture of their fleet's activities.

Telematics solutions can help fleet managers optimize workforce productivity, improve maintenance scheduling, and most importantly, monitor driver behaviour to decrease costs. Vehicle Telematics have a wide range of applications like real time movement and behaviour of a vehicle can be determined most efficiently. In addition to tracking this Telematics will give minute to minute live updates of vehicle. This system not only monitors but also sends the data which was monitored which helps to diagnosis a issue and leads to a new technology. The convergence of telecommunications and information processing, the term later evolved to refer to automation in automobiles, such as the invention of the emergency warning system for vehicles. GPS/GPRS navigation, integrated hands-free cell phones, wireless safety communications and automatic driving assistance systems all are covered under the Telematics umbrella. It is the combined application of Telecommunication and informatics in wireless technology, Community guidelines for the development (2002).

## 3. VALUE IN VEHICLE TELEMATICS

To identify the opportunities for IT in Telematics, we need to understand and analyse the value chain in this domain, as indicated by the following in Figure 2, Phial, Robert (2002).

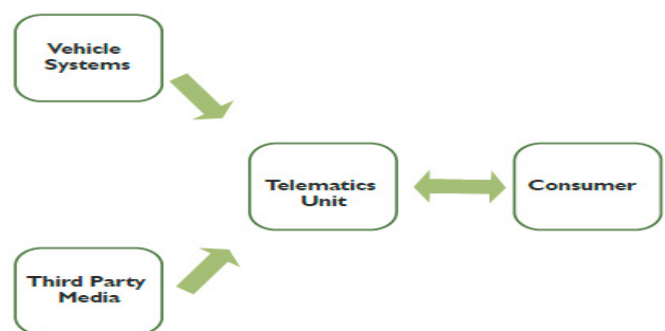


Fig. 2. Value chain telematics.

Telematics Unit is the communication component that talks directly with the vehicle. There are two data sources for the unit – the vehicle itself and third party media content beamed from the outside world. This third party content is primarily Internet driven data, voice and video content provided by web portals. The consumer can either be the vehicle driver/passengers accessing the data or the entities that want to use vehicle generated content.

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